NOTE

Chapter 21 contains emergency rescue and
mishap response information for the following aircraft:

USN	**F-5E/F**
USN	**F-14/F-14+**
USN	**F/A-18A/B/C/D/E/F**

CHAPTER 21

U.S. NAVY

FIGHTER

AEROSPACE EMERGENCY RESCUE AND MISHAP RESPONSE INFORMATION

21-1. INTRODUCTION AND USE.

21-2. This section contains emergency rescue and mishap response information illustrations in alpha-numerical order relative to type and model of aircraft. This arrangement of illustrations is maintained from Chapter 4 throughout the remainder of the publication.

21-3. GENERAL ARRANGEMENT.

21-4. Aircraft type designation has been positioned in the upper right corner of the horizontal illustration for rapid identification. Additional aids to rapid orientation are:

a. Recent technological advances in aviation have caused concern for the modern firefighter. Aircraft hazards, cabin configurations, airframe materials, and any other information that would be helpful in fighting fires, the locating and rescue of personnel will be added as the information becomes available.

b. Suggested special tools/equipment are listed in the upper left corner, on the Aircraft/Entry page of each listed aircraft.

c. Procedural steps covering emergency/ normal entrances, cut-ins, engine/APU shutdown, safetying ejection/escape systems, and aircrew extraction are outlined on the left side of each page with coordinated illustrations on the right.

d. Illustrations located on right side of pages are coordinated with text by numerals and small letters depicting both paragraph and subparagraph on the page.

e. Each illustration is consistently colored and/or pattern keyed to highlight essential emergency rescue information.

f. Details are pulled directly from the illustration to highlight an area, thus eliminating unnecessary searching for desired information.

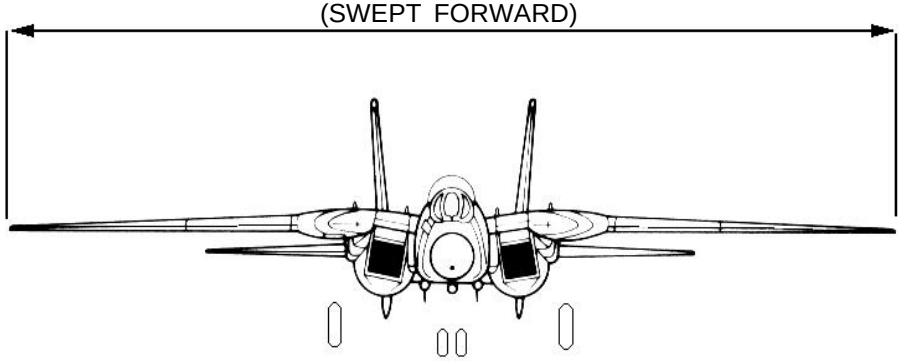
NOTE:

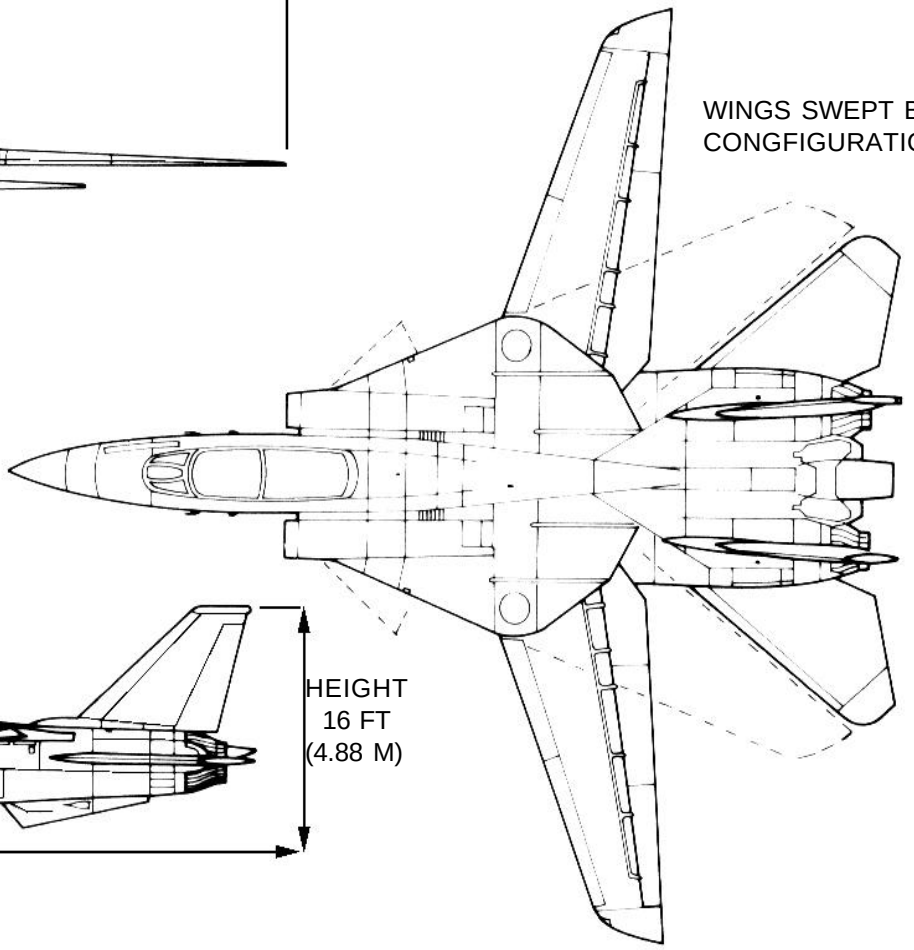
The US Navy F-5E/F is the same as the USAF F-5E/F. Refer to Chapter 8, pages F-5.1 thru F-5.6 for complete procedures.

AIRCRAFT PAINT SCHEME

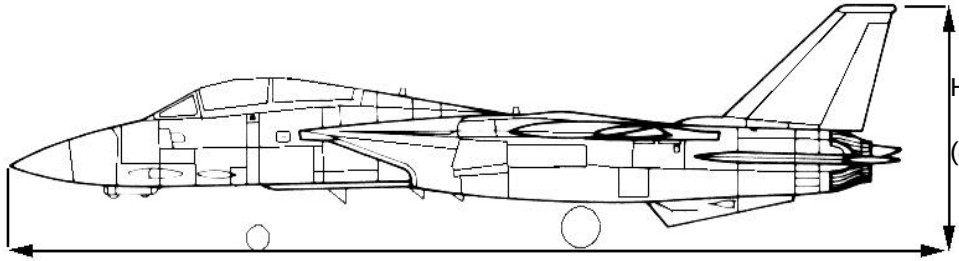
AIRCRAFT DIMENSIONS

WING SPAN
64 FT 2 IN (19.54 M)
(SWEPT FORWARD)





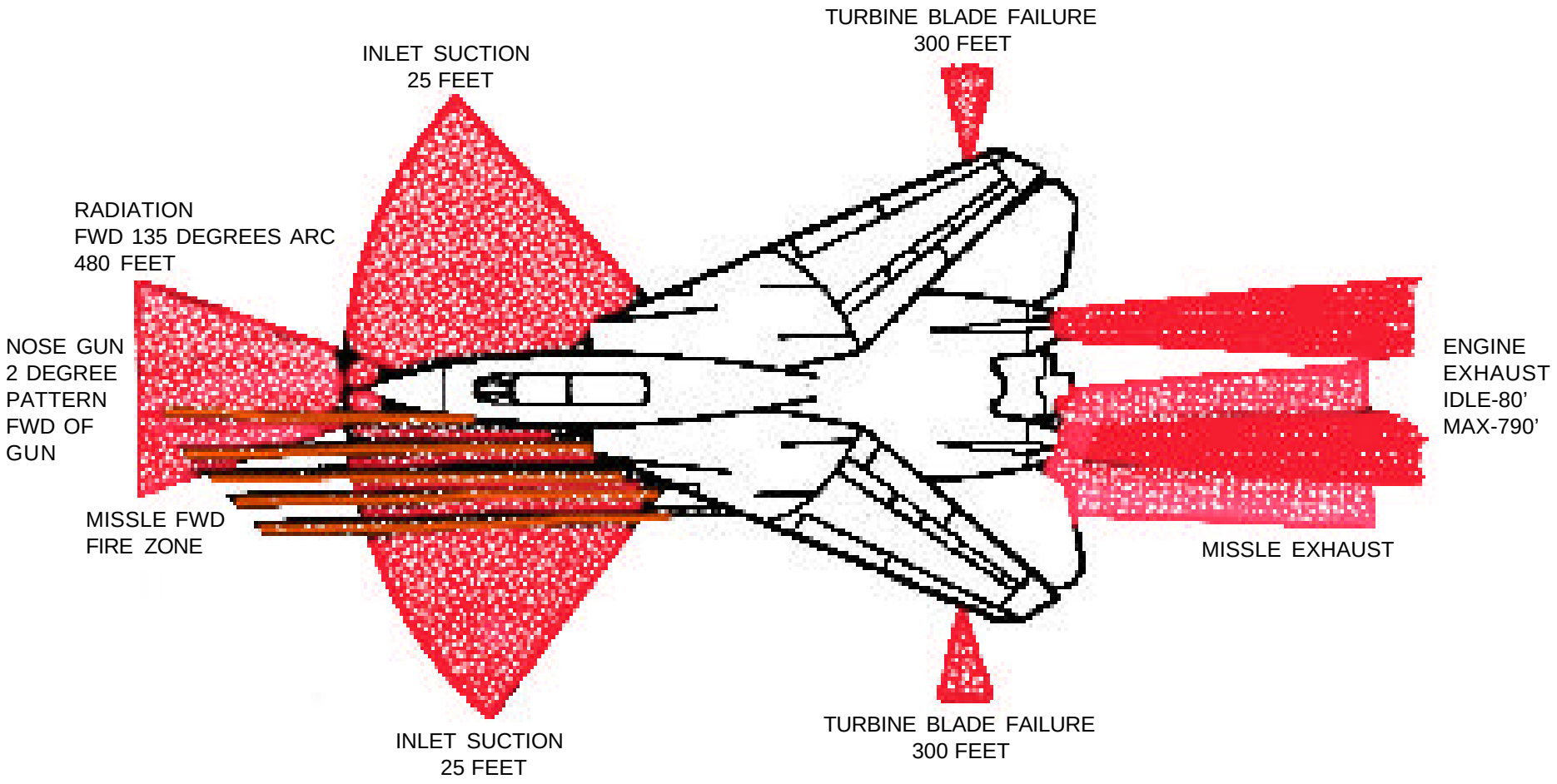
WINGS SWEPT BACK
CONGFIGURATION



HEIGHT
16 FT
(4.88 M)

LENGTH
61 FT 10 IN (18.96 M)

AIRCRAFT HAZARDS



AIRCRAFT HAZARDS-Continued

ARMAMENT LOCATIONS

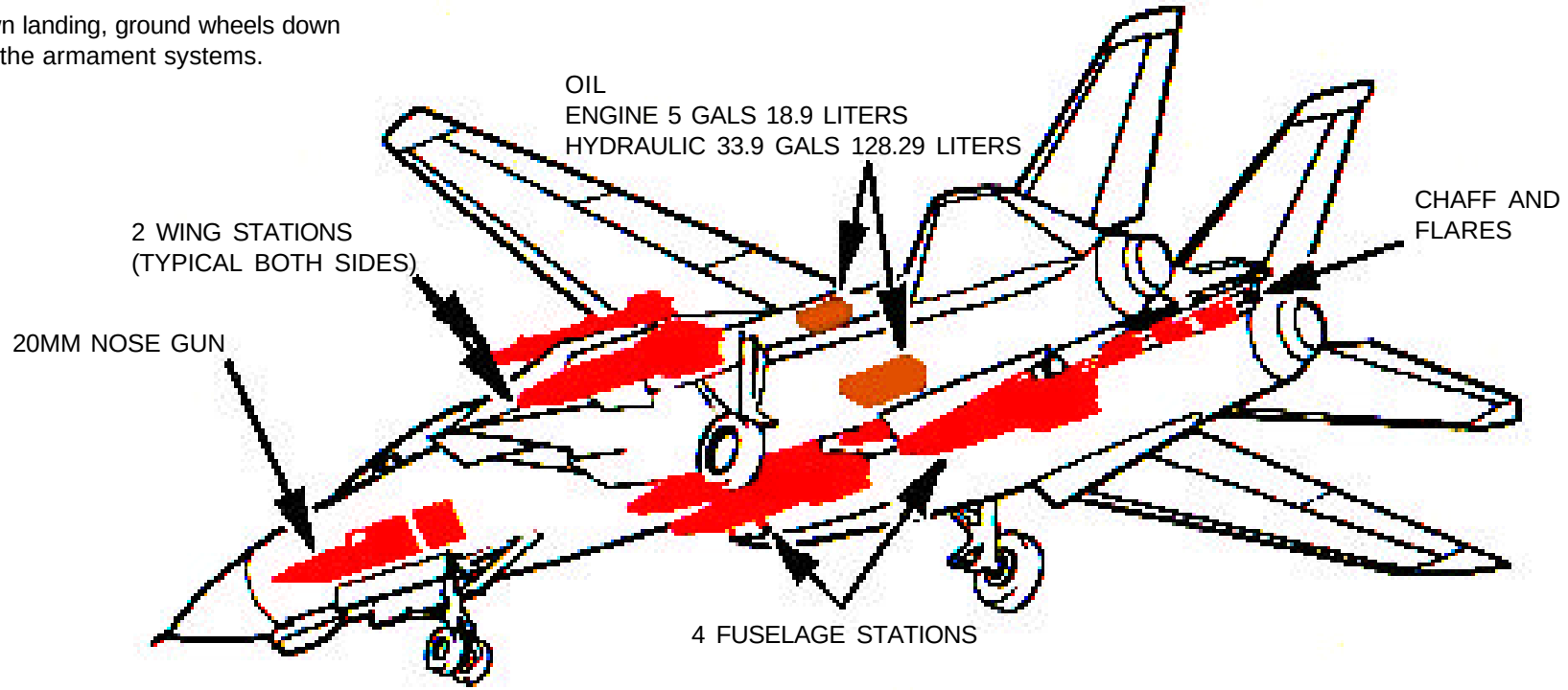
WARNING

Wing and fuselage stations have pylon ejector cartridges.

WARNING

In the event of wheels-up landing, secure all electrical power to ensure armament system safety.

NOTE:
In normal wheels down landing, ground wheels down switches, and safety the armament systems.



AIRFRAME MATERIALS

LEGEND

ALUMINUM

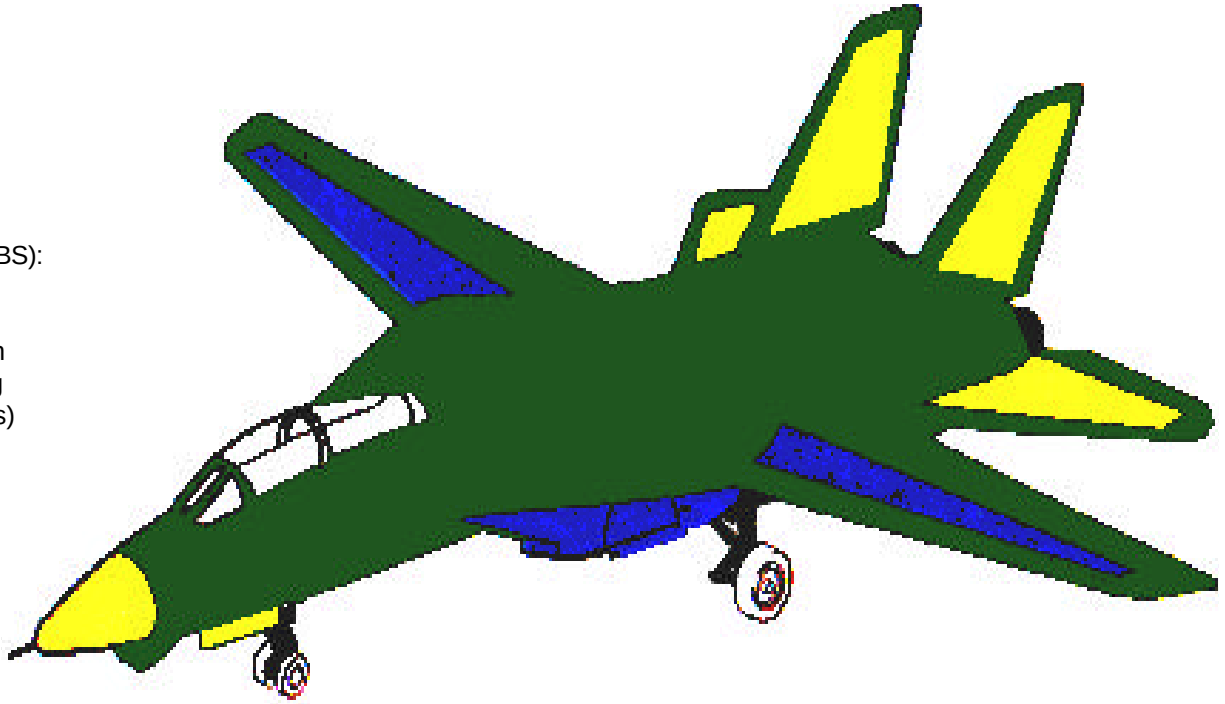
STEEL

TITANIUM

OTHER (BORON/TUNGSTEN/FIBERGLASS)

COMPONENT COMPOSITION (TOTAL WEIGHT 1163.5 LBS):

a. Horizontal Stabilzation Skins are boron and weigh approximately 65 each = 260 lbs
b. Composite Over Wing Fairing are graphite and weigh approximately 327.2 each = 654.4 (These are being replaced with conventional OWF with no composites)
c. Ventral Fins are Fiber Glass and weigh 69.5 each = 139lbs
d. Radome is Fiber Glass and weighs approximately 105.1lbs
e. Nose Landing Gear fwd doors are Fiber Glass and weigh approximately 5 lbs



SPECIAL TOOLS/EQUIPMENT
Power Rescue Saw
10 Inch Drift Punch
Crash Ax
Fire Drill II

AIRCRAFT ENTRY

WARNING

FOD in area of backup initiator, located on turtle deck aft of RIO seat may become entangled with initiator pin. This may cause pin extraction and seat ejection when canopy is raised. Visually check area for FOD prior to raising canopy.

WARNING

Do not jettison canopy with fuel in cockpit area. Fire or explosion may result. The canopy trajectory when jettisoned, is up and aft. Ensure personnel and equipment are clear of area immediately to the rear of the aircraft.

1. NORMAL ENTRY

a. Open access hatch on bottom of boarding ladder panel, pull and turn handle to the NORM OPEN position. Once canopy is opened, rotate handle to HOLD.

b. Two additional positions may be selected by turning the canopy selector handle to AUX OPEN or BOOST.

2. EMERGENCY ENTRY

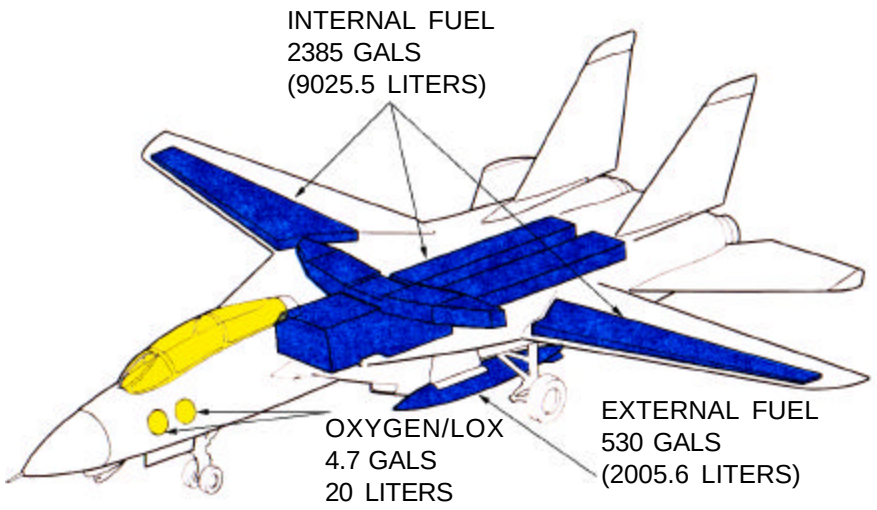
a. Push button to open door. Squeeze T-handle and pull to jettison canopy.

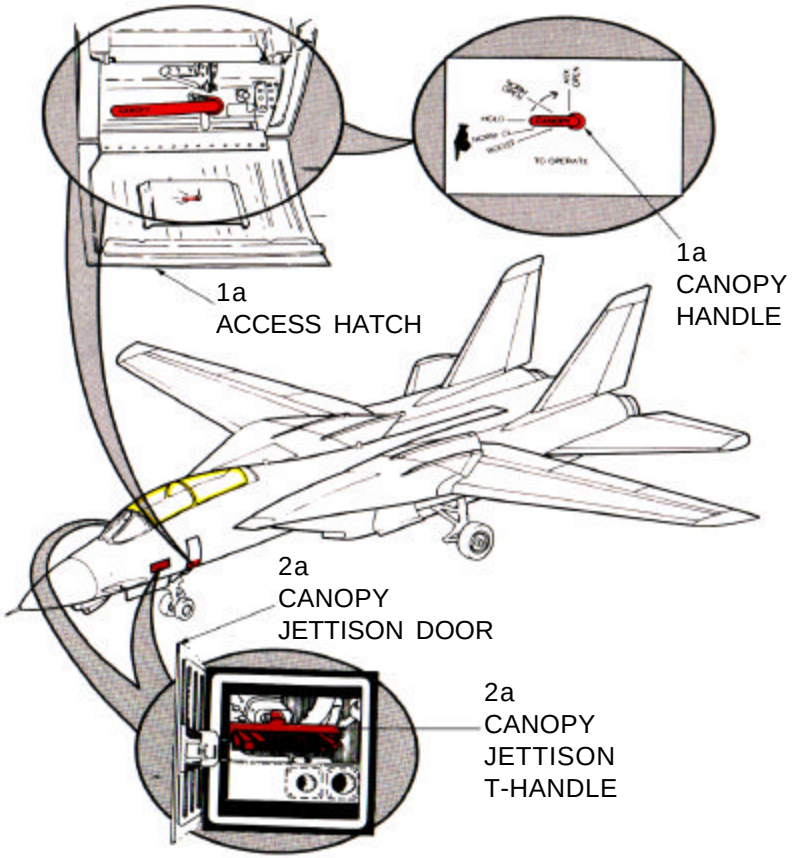
NOTE:

Canopy may be jettisoned from either side of the aircraft under pilot's cockpit marked "RESCUE".

3. CUT-IN/FORCED ENTRY

a. Canopy is acrylic plastic and may be cut with a power rescue saw or crash ax. Cut along canopy frame on all four sides.





CANOPY SAFETY AND ENGINE SHUTDOWN

1. CANOPY SAFETY

NOTE:
Canopy is pneumatic and hydraulically operated for normal opening and closing. During emergency, the canopy can be jettisoned by a pneumatic and pyrotechnic initiator device.

a. To safety canopy, insert safety pin into backup initiator, located on turtle deck aft of RIO seat.

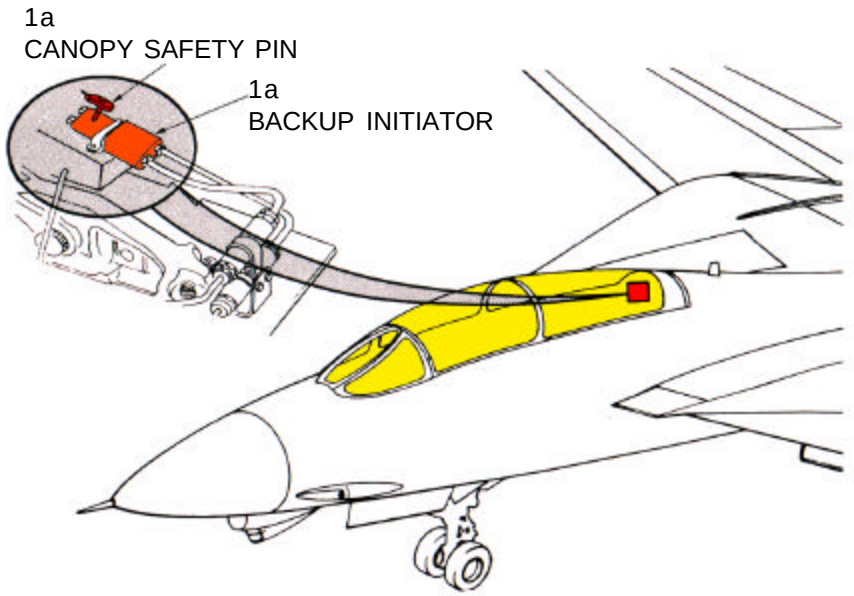
2. ENGINE SHUTDOWN

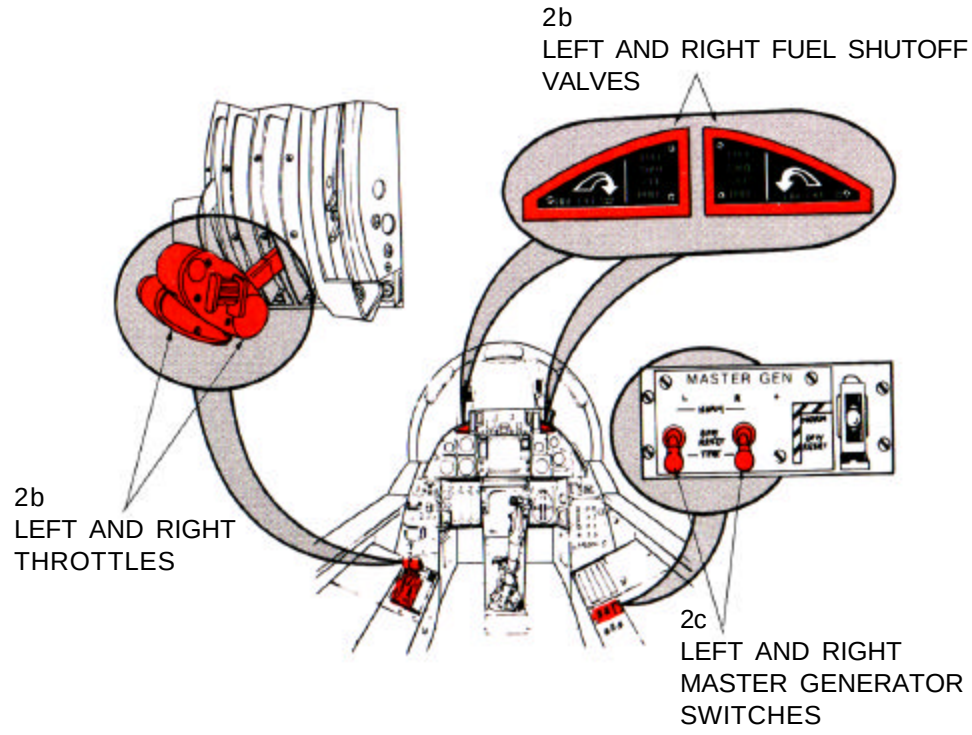
NOTE:
Engines may be shut down by throttles or fuel shutoff valves.

a. Move throttles (left throttle first) full aft to OFF position by retarding through IDLE position, then outboard.

b. Pull left and right fuel shutoff valves, located on pilot's center instrument panel, under glare shield.

c. Place master generator switches down in OFF position.





MARTIN-BAKER MK GRU-7A EJECTION SEAT

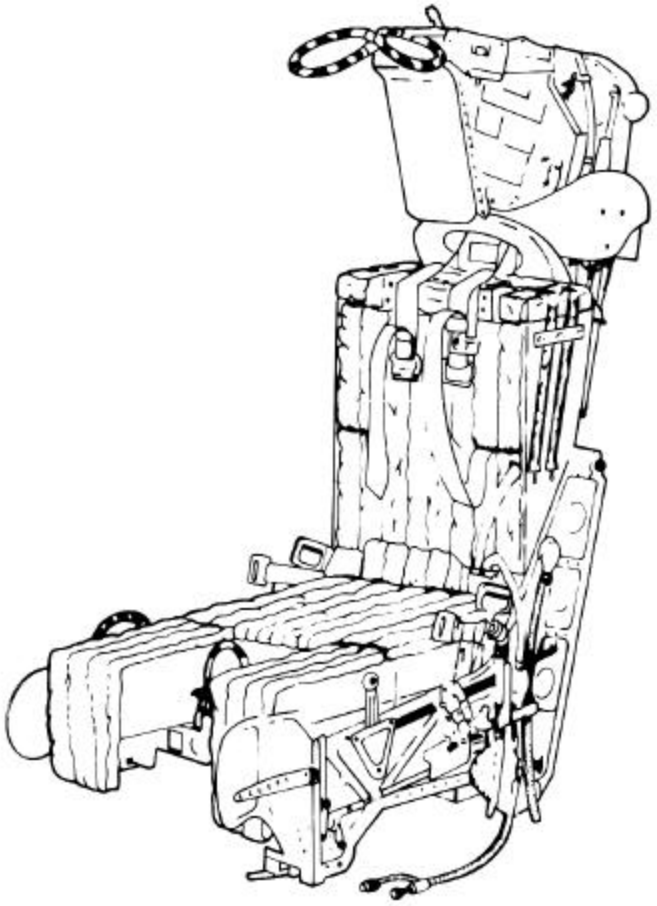
1. GENERAL INFORMATION

The Martin-Baker MK GRU-7A is a rocket assisted ejection seat that provides support and necessary environmental equipment for crewmembers during flight, and a means of fast, safe escape during emergency flight conditions. The seat assembly incorporates features permitting seat ejection at ground level, at zero airspeed as well as during emergency flight conditions.

The basic structure of the seat consists of a main beam assembly, built to withstand high G-loads, support all of the components, and form the main framework for the seat.

The basic components of the seat assembly include a catapult, gas powered inertia reel, rocket motor, seat bucket assembly, drogue gun, parachute, guillotine, and survival equipment.

This ejection seat presents definite hazards which may cause fatal injuries to uninformed and careless personnel. Firefighting/rescue personnel must become thoroughly familiar with the locations and the safetying of the seat components in both normal and emergency conditions.



EJECTION SEAT SAFETYING

1. NORMAL EJECTION SEAT SAFETYING

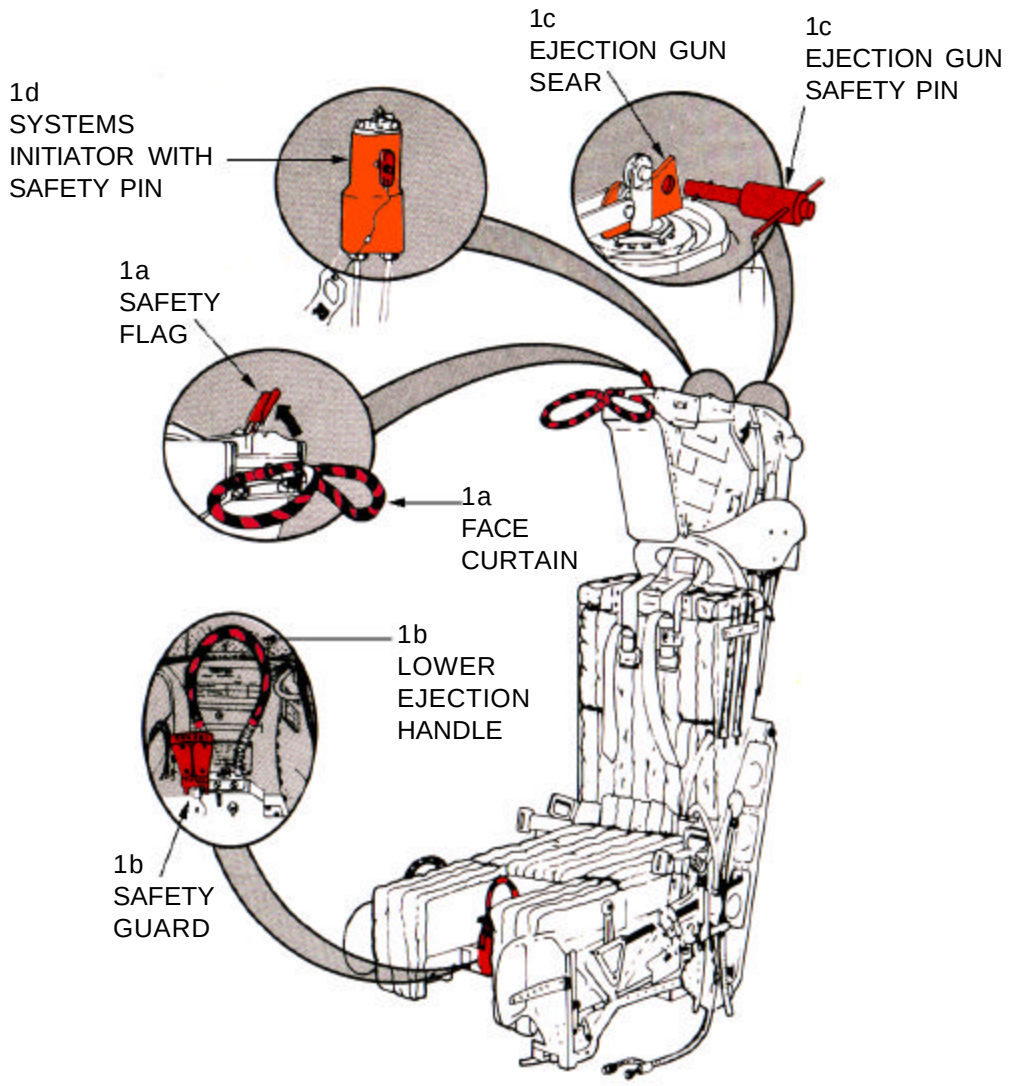
NOTE:
Immediately upon gaining access to the aircraft cockpit, if time permits and no hazardous conditions exist, proceed with normal seat safetying procedures.

a. Place safety flag for face curtain, located on top forward of seat, in UP/LOCKED position.

b. Rotate lower firing handle guard, located lower center of seat, to UP/LOCKED position.

c. Insert ejection gun safety pin into ejection gun sear, located top aft of seat.

d. Insert safety pin into systems initiator, located top back of seat (install pin from aft side of initiator).



EJECTION SEAT SAFETYING- Continued

1. NORMAL EJECTION SEAT SAFETYING- Continued

e. Insert safety pin into drogue gun sear, located on upper left side of seat.

f. Insert safety pin into rocket gas generator sear, located on upper left side of seat forward and above the drogue gun.

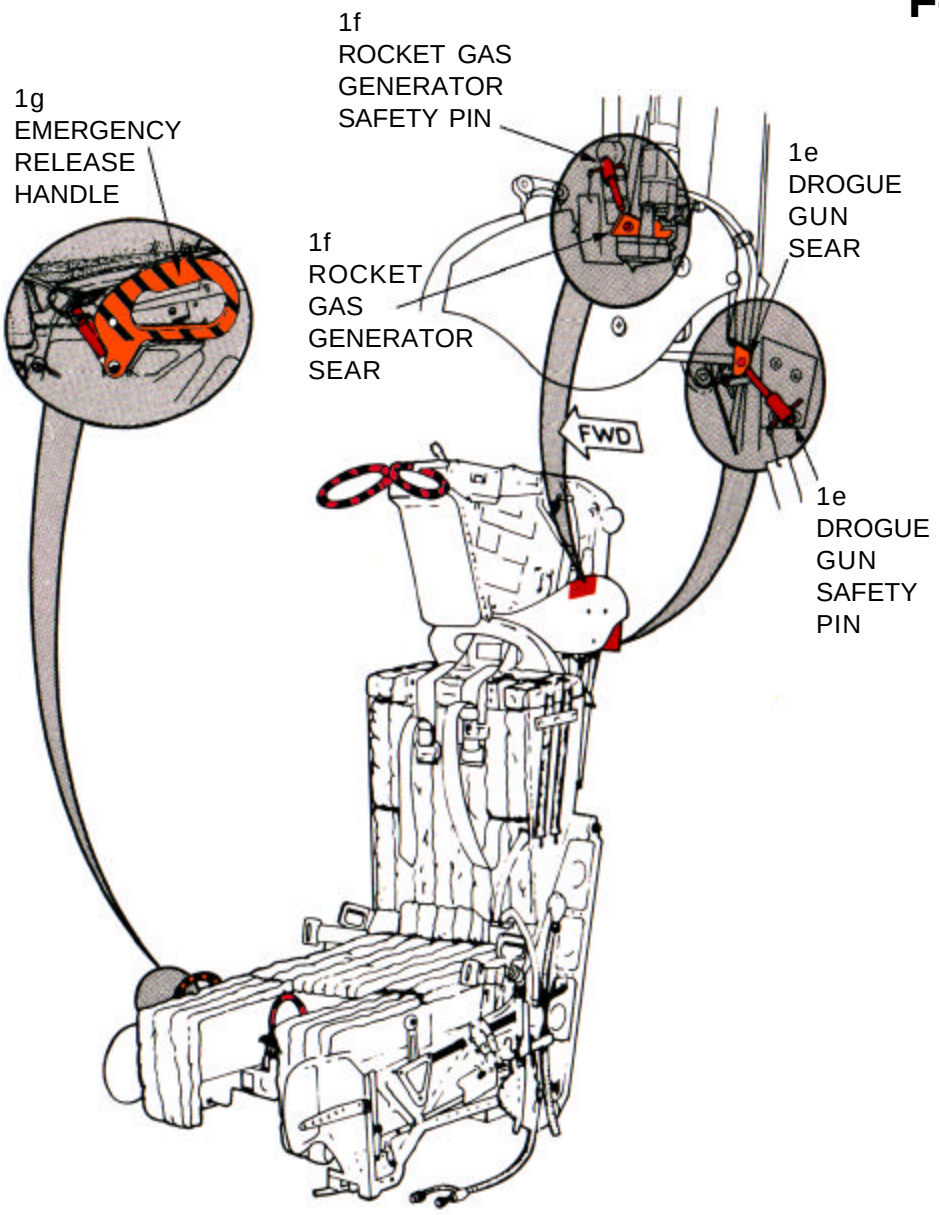
g. After removing crewmember, insert lock assembly into emergency release handle, located on forward right side of seat.

WARNING

In multi-seat aircraft, all ejection seats must be safetied due to command ejection possibility.

WARNING

When removing personnel from ejection seats, do not allow crewmembers or rescue personnel to become entangled in lower seat ejection handle or use face curtain handle as a support or hand hold.



EJECTION SEAT SAFETYING- Continued

1. EMERGENCY EJECTION SEAT SAFETYING

NOTE:
The MARTIN-BAKER MK GRU-7A ejection seat presents special hazards to rescue personnel. Safetying the entire seat under emergency conditions may not be feasible. To temporarily render seat safe for the removal of disabled crewmembers, comply with the following:

a. Place safety flag for face curtain, located on top forward of seat, in UP/LOCKED position.

b. Rotate lower firing handle guard, located lower center of seat, to UP/LOCKED position.

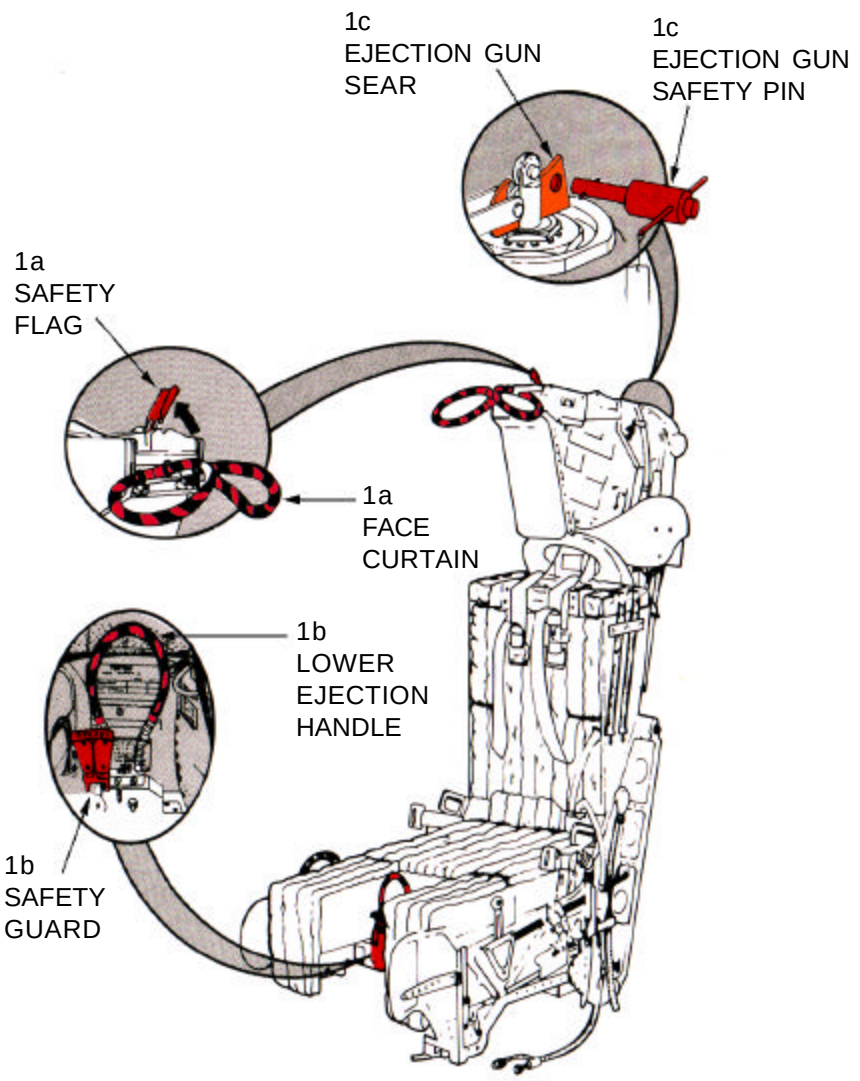
c. Insert ejection gun safety pin into ejection gun sear, located top aft of seat.

WARNING

In multi-seat aircraft, all ejection seats must be safetied due to command ejection possibility.

WARNING

When removing personnel from ejection seats, do not allow crewmembers or rescue personnel to become entangled in lower seat ejection handle or use face curtain handle as a support or hand hold.



AIRCREW EXTRACTION

1. AIRCREW EXTRACTION

NOTE:

The crewmembers are attached to the seat by the use of an integrated harness and leg restraints. Additionally, the oxygen/communication lead and anti-G suit hose are attached to the personnel services block.

a. To remove oxygen mask: Pull down release tabs on either side of crewmember helmet mask.

b. To disconnect the oxygen/communication lead outlet from the services block on the left side of seat: Pull up on round collar while pulling apart connection.

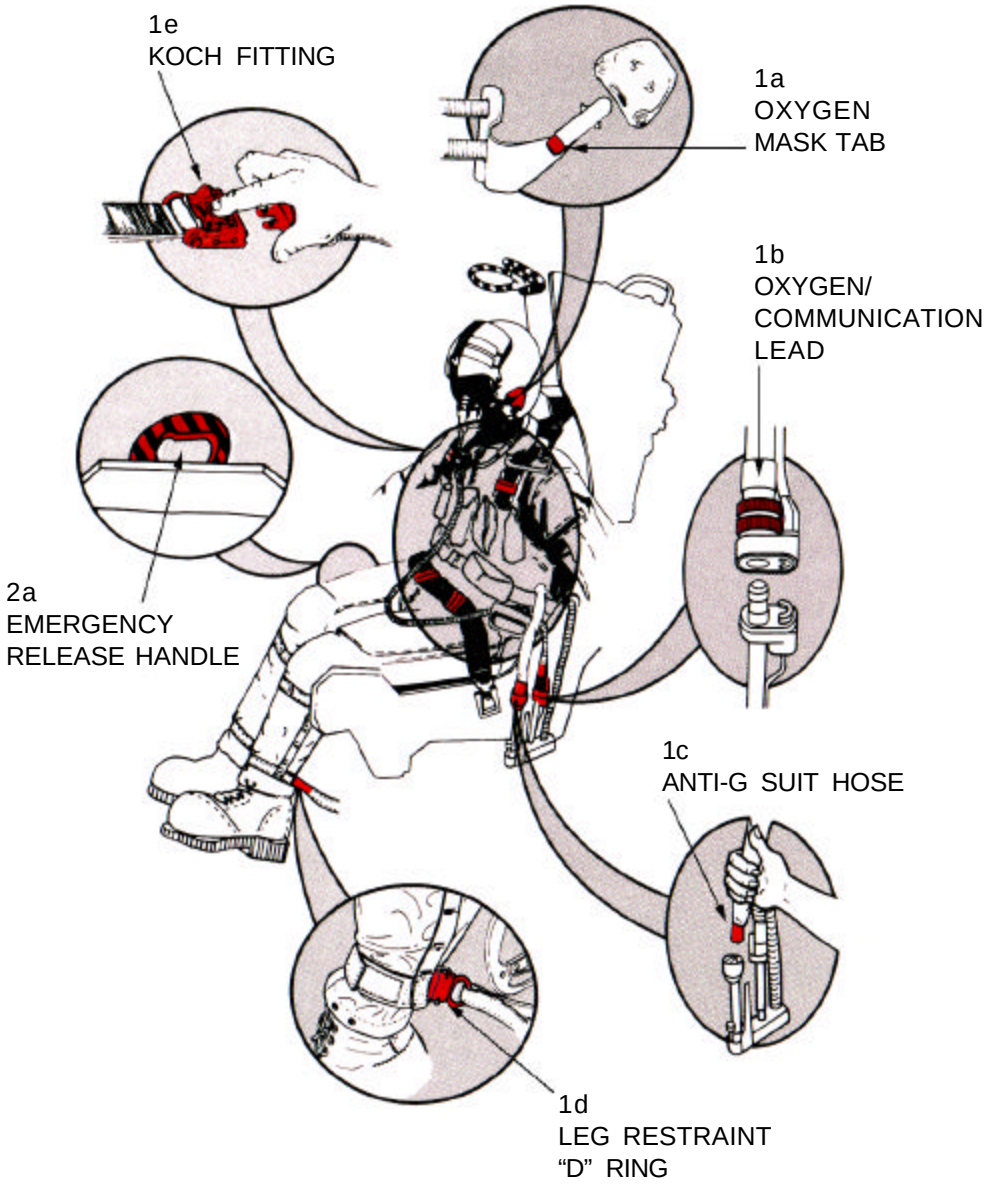
c. To disconnect the anti-G suit: Pull anti-G suit hose from left seat connection.

d. To disconnect leg restraints: Pull each leg restraint line “D” ring from the leg garter quick disconnect.

e. To disconnect restraints: Release two lap belt, then two shoulder harness koch fittings.

2. EMERGENCY RELEASE

a. Actuating the emergency restraint release handle will free the crewmember from the seat and “safes” the upper and lower ejection handles when pulled to the aft position. However, the parachute and survival kit will remain attached to crewmember.



AIRCRAFT PAINT SCHEME FOR A/F-18A/B/C/D

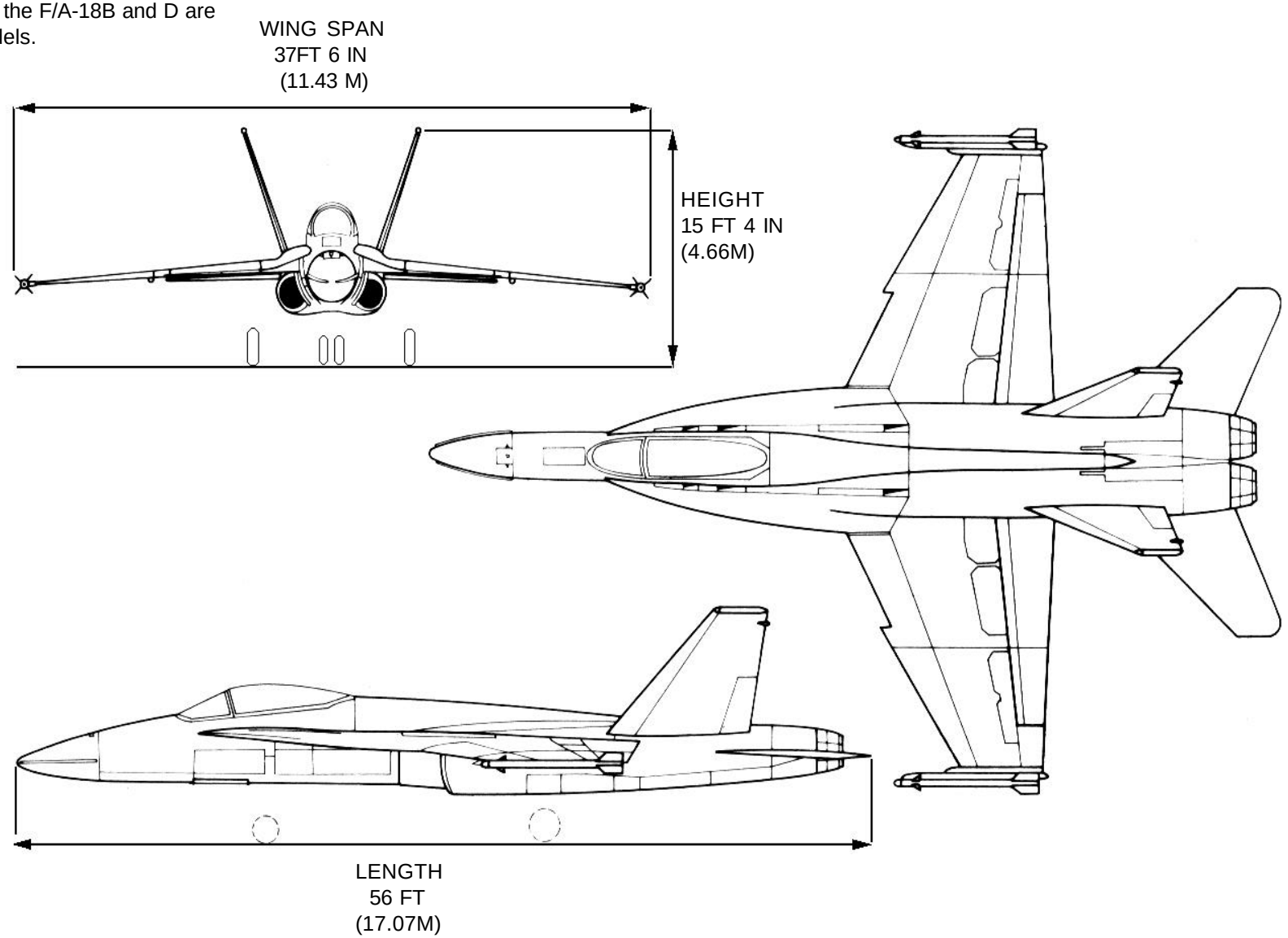
AIRCRAFT PAINT SCHEME FOR A/F-18E/F

AIRCRAFT DIMENSIONS

EFFECTIVITY: F/A-18A/B/C/D

NOTE:

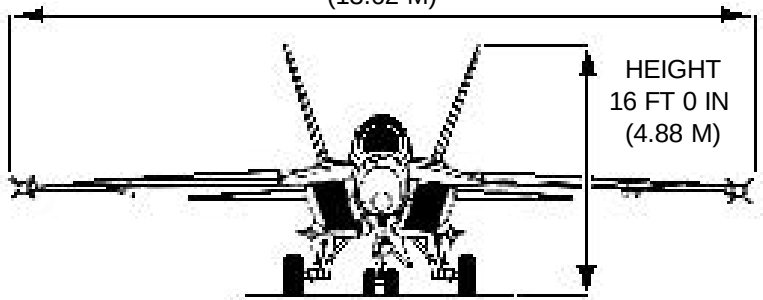
The F/A-18 A and C are single seat models while the F/A-18B and D are two seat models.

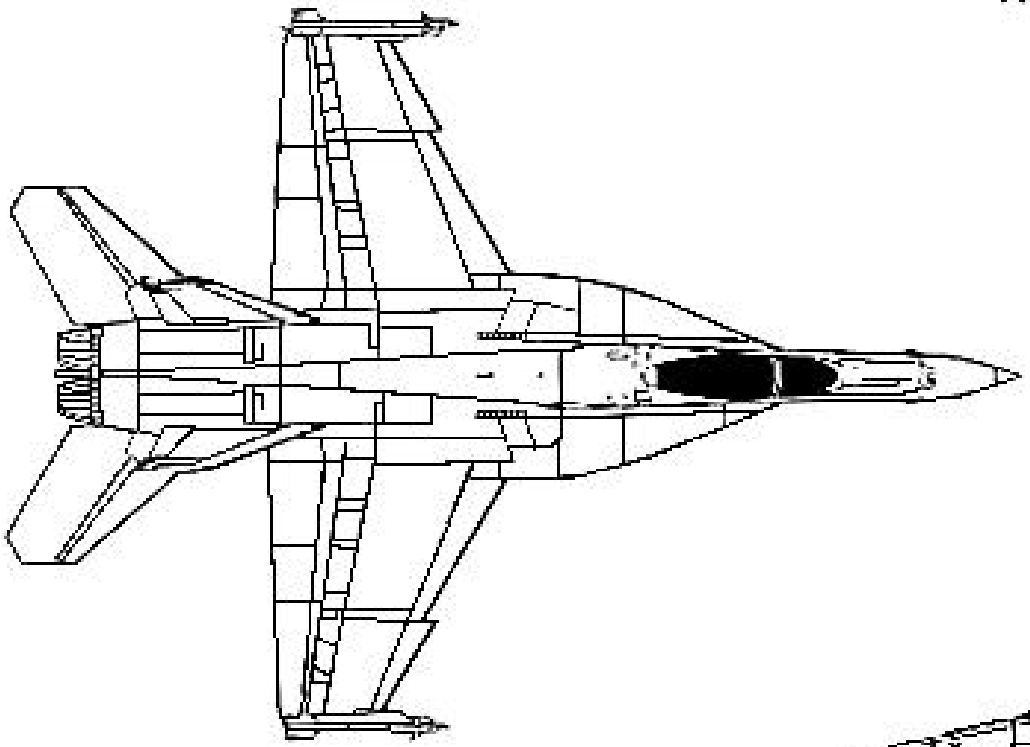


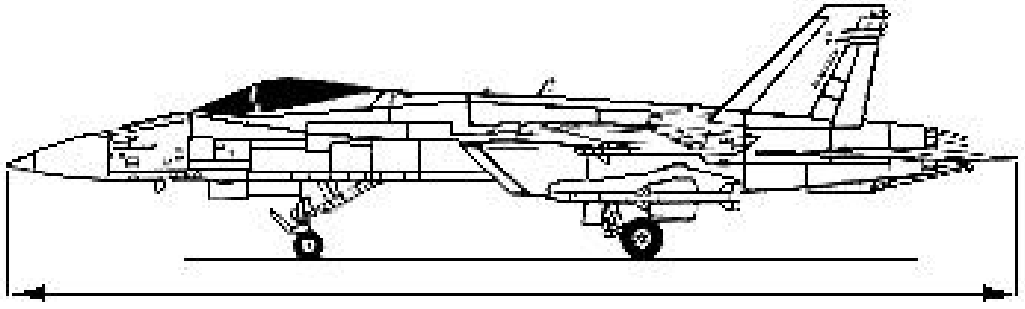
AIRCRAFT DIMENSIONS-Continued

EFFECTIVITY: F/A-18E/F

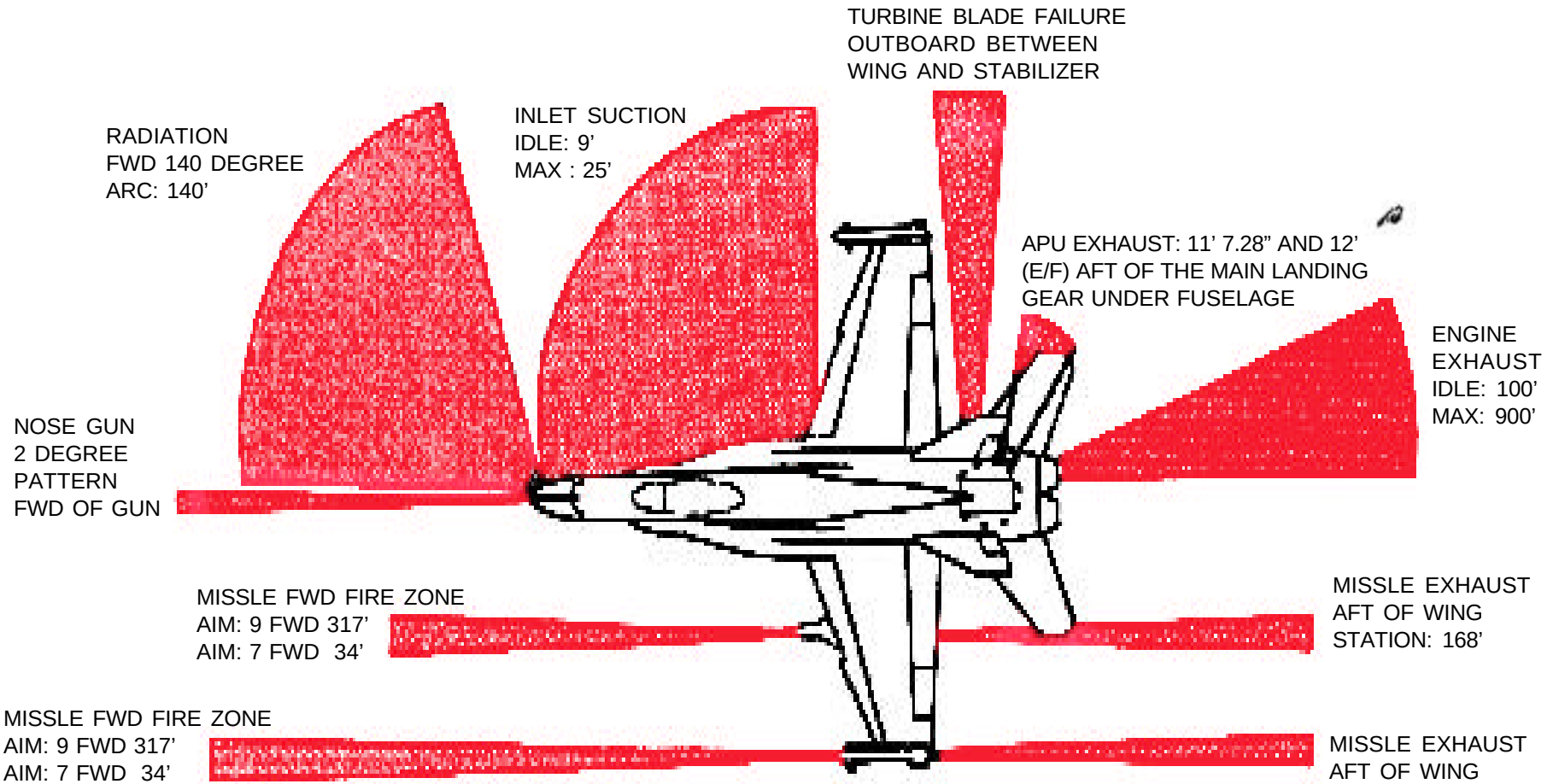
NOTE:
The F/A-18E is single seat model while the F/A-18F is a two seat model.







AIRCRAFT HAZARDS



AIRCRAFT HAZARDS-Continued

NOTE:

In normal wheels down landing, ground wheels down switches safety the armament systems.

WARNING

Aircraft has chaff and flares installed. Pylons have ejector cartridges installed.

NOTE:

On aircraft 164196 and up, including E/F version, Deployable Flight Incident Recorder Set (DFIRS). The DFIRS comprises the following components:

(1) TLX thin-layered transfer system
(2) Impact initiator and cartridge
(3) Underwater initiator and cartridge
(4) Severable door
(5) Front mount and cartridge
(6) Deployable flight incident recorder

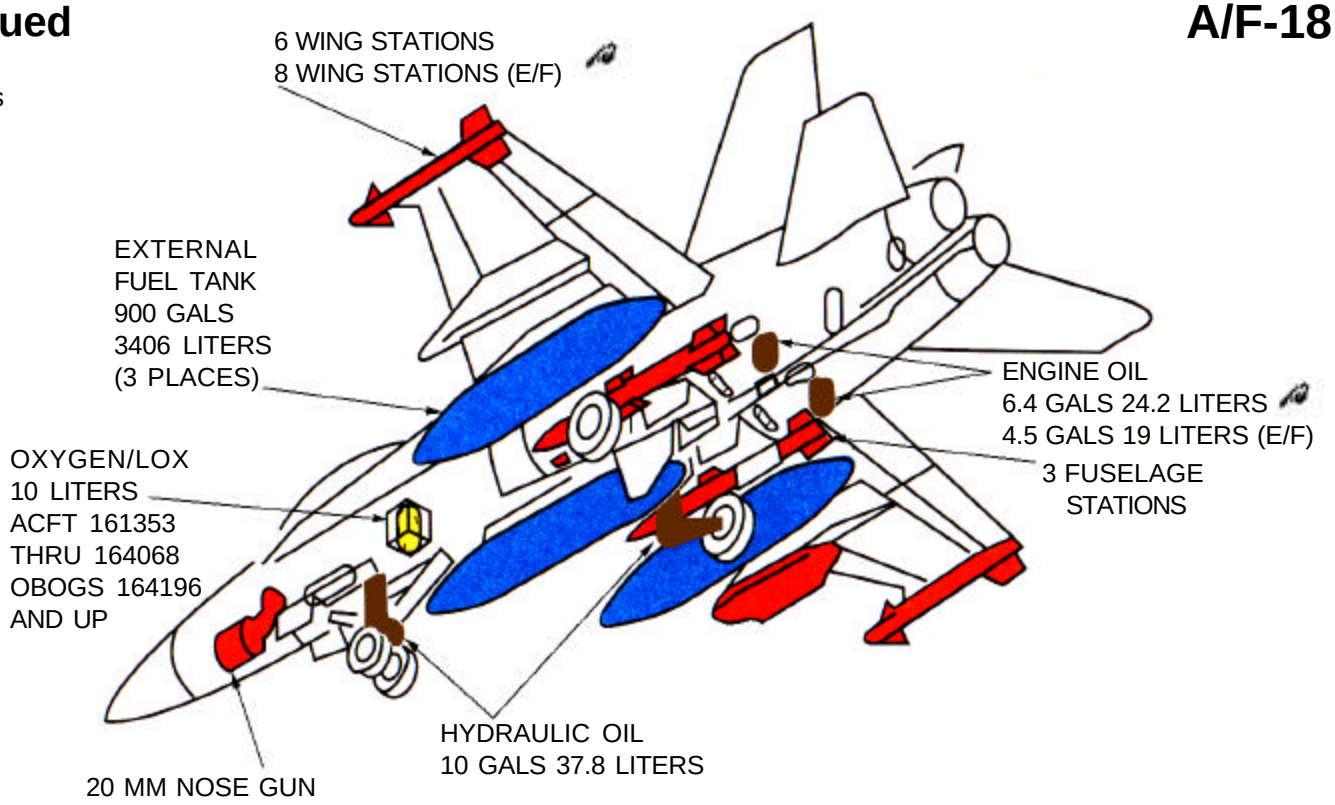
NOTE:

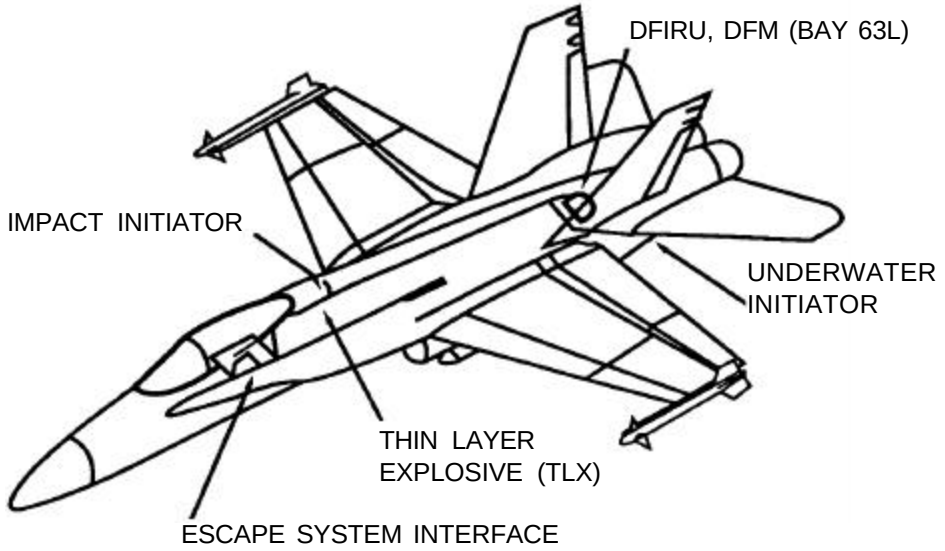
DFIRS deploys under the following conditions:

(1) Ejection: DFIRS is deplyed immediately upon initiation of ejection.

(2) Crash (without ejection): DFIRS is deployed when the impact initiator senses 20 G's (longitudinal).

(3) Water submersion (without ejection): DFIRS is deployed when aircraft is deployed when aircraft is submerged is greater than 15 feet of water without sufficient longitudinal impact force for crash initiation (approximately 100 kts).





AIRCRAFT ARMAMENT

ARMAMENT - F/A18A/B/C/D
One M61A1/2 Vulcan 20mm cannon

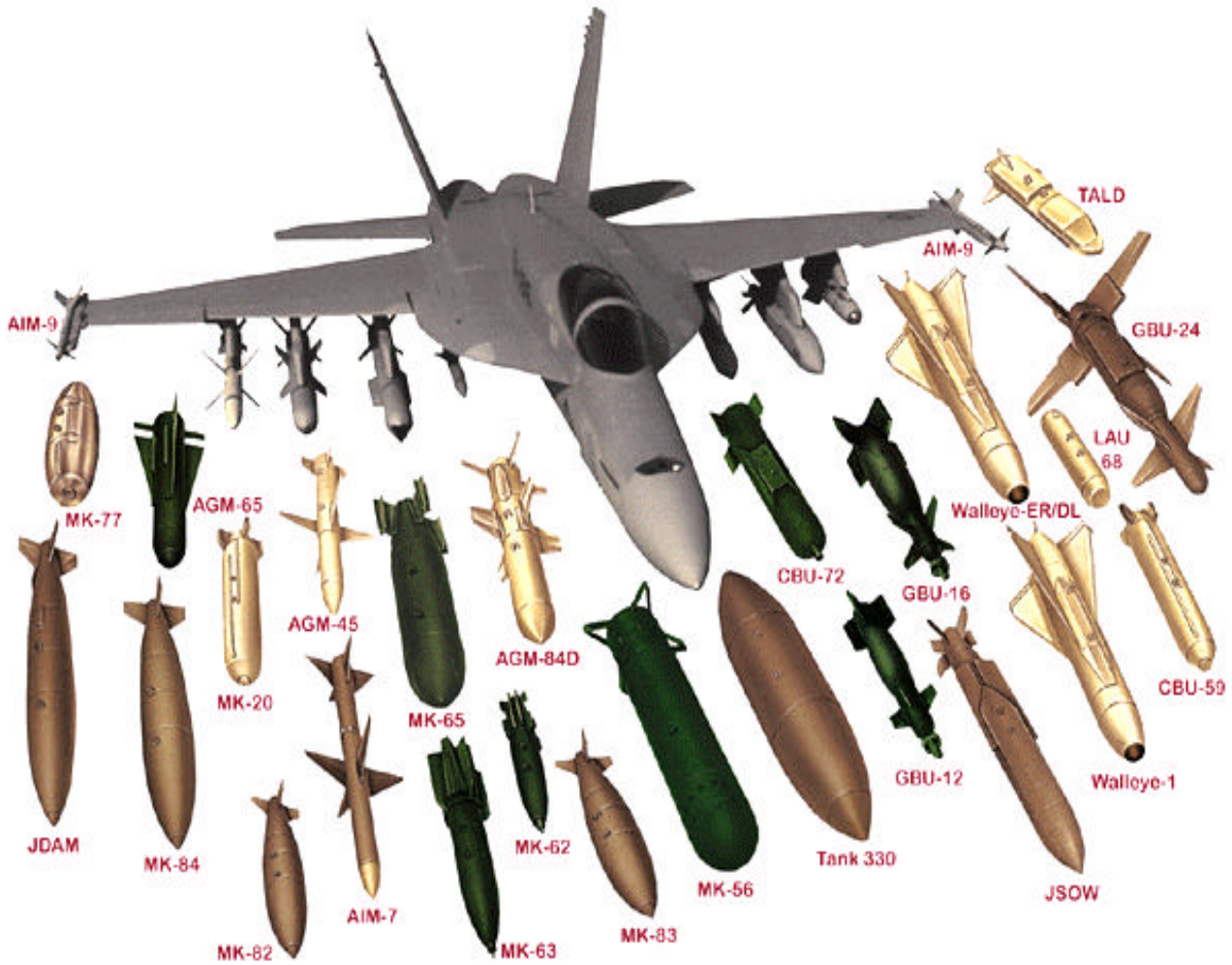
EXTERNAL PAYLOAD:
AIM 9 Sidewinder, AIM 7 Sparrow, AIM-120 AMRAAM, Harpoon, Harm, SLAM, SLAM-ER, Maverick missiles; Joint Stand-Off Weapon (JSOW); Joint Direct Attack Munition (JDAM); various general purpose bombs, mines and rockets.

ARMAMENT - F/A-18E/F

NOTE:
The F/A-18E/F models has additional weapon stations in comparison to the F/A-18C/D totalling 11.

One M61A1/2 Vulcan 20mm cannon

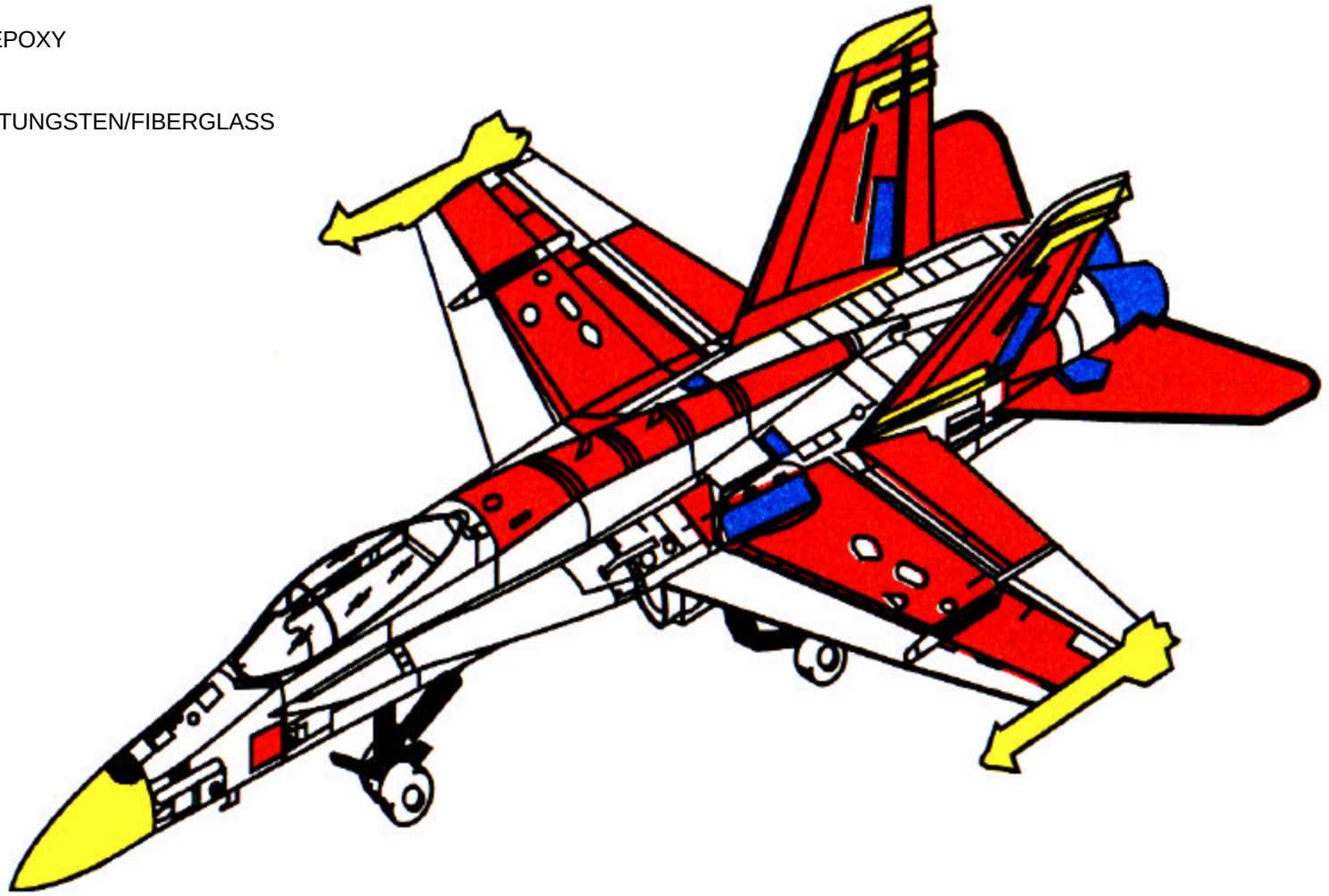
EXTERNAL PAYLOAD:
AIM Sidewider, AIM-9X (projected), AIM 7 Sparrow, AIM-120 AMRAAM, Harpoon, Harm, SLAM, SLAM-ER (projected), Maverick missiles;Joint Stand-Off Weapon JSOW); Joint Direct Attack Munition (JDAM); Data Link Pod; Paveway Laser Guided Bomb; various general purpose bombs, mines and rockets.



AIRFRAME MATERIALS

LEGEND

- ALUMINUM
- STEEL
- TITANIUM
- GRAPHITE EPOXY
- OTHER
  BORON/TUNGSTEN/FIBERGLASS



SPECIAL TOOLS/EQUIPMENT
Power Rescue Saw
Crash Ax Fire Drill II
3/8 Inch Drive Socket Wrench
1/4 Inch Drive Socket Wrench
7/32 Inch Key Socket Headscrew

AIRCRAFT ENTRY-ALL MODELS

WARNING

After flight, before personnel can safely touch the windshield and canopy, high voltage static discharged by using anti-static gloves.

1. NORMAL ENTRY

a. Canopy is electronically operated. To open canopy, press center button to release door 9 and expose the control switch. Hold switch in UP position until canopy is fully open.

2. MANUAL ENTRY

a. Canopy can be opened by inserting 3/8-inch drive socket wrench or breaker bar into manual open socket. Rotate counterclockwise 35 turns or 112 turns on 2 seat models to fully open canopy.

3. EMERGENCY ENTRY

WARNING

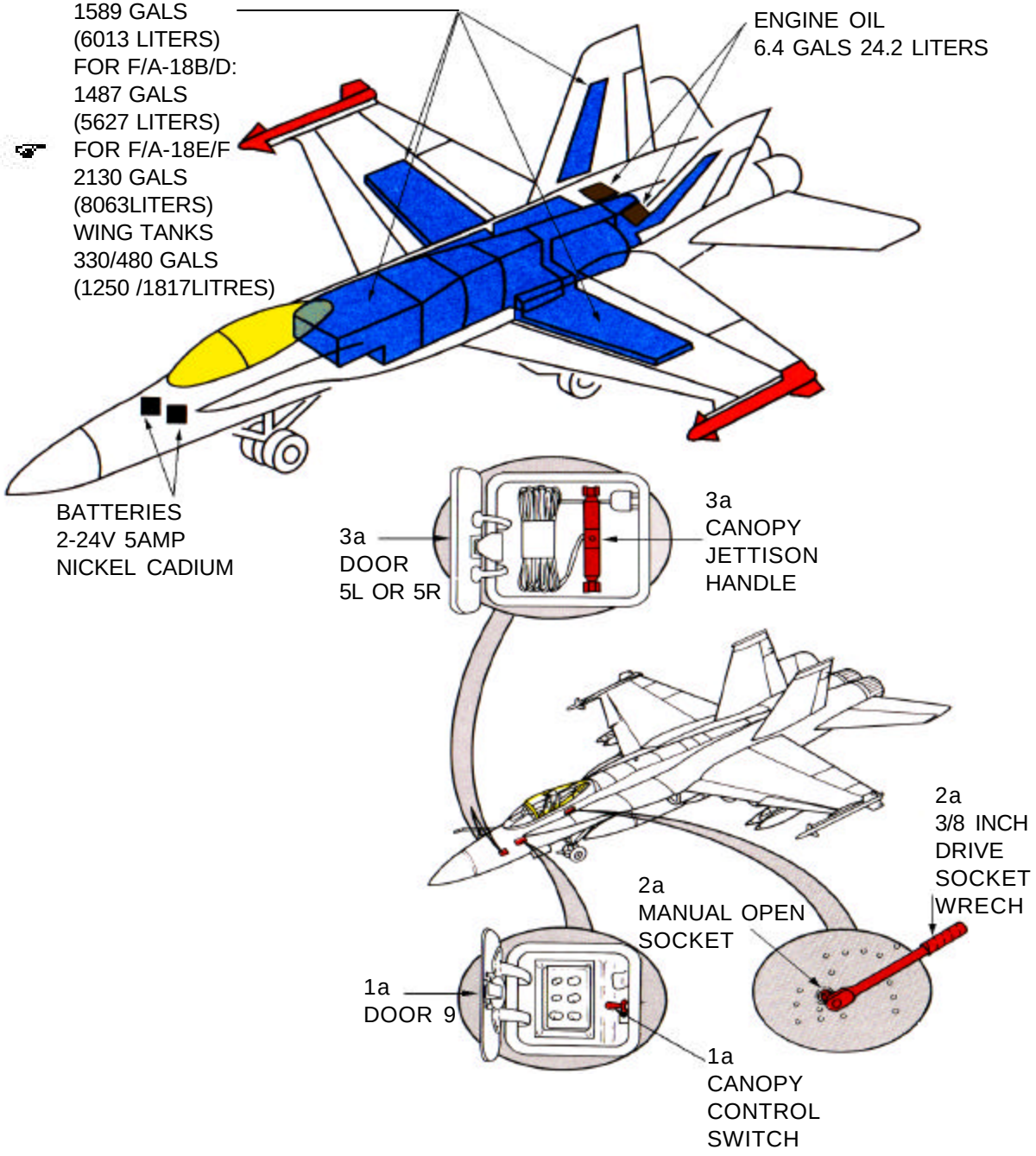
If fuel or other flammable fluids are present, it is not advisable to jettison canopy because rocket motors, when fired, can ignite these fluids.

a. Canopy may be jettisoned from either side of aircraft. Open door 5L or 5R and remove handle. Move away from aircraft the full length of canopy jettison cable and yank hard. Canopy will impact approximately 30 feet behind aircraft.

NOTE:
On aircraft 162826 and up, canopy can only be jettisoned from inside the cockpit.

4. CUT-IN/FORCED ENTRY

a. Canopy is acrylic plastic and may be cut with power rescue saw or ax. To avoid canopy fracture spray with CO2 to make brittle and easy to break. Cut along canopy frame, all four sides.



CANOPY SAFETY

1. CANOPY SAFETY FOR F/A-18A/B/C/D

WARNING

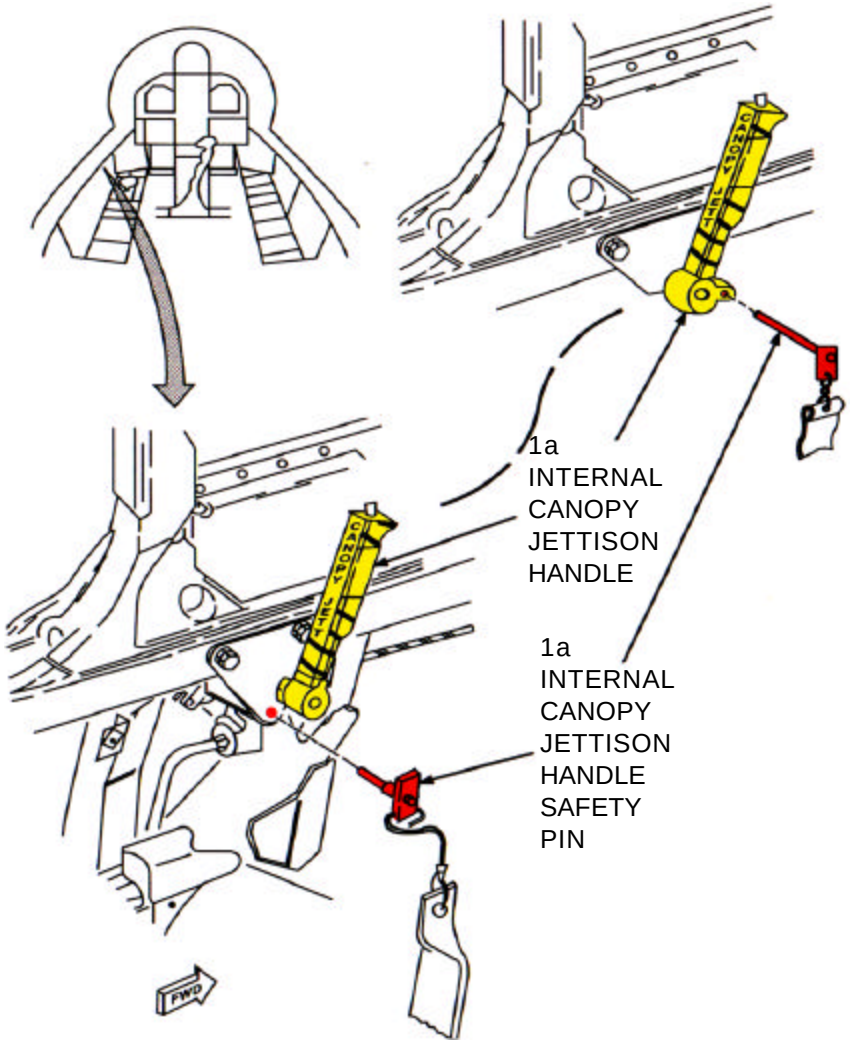
During flight of the F-18 aircraft, a high voltage (100,000 volts) static electrical charge may build up and be stored in the windshield and canopy. After flight, static charge buildup must be discharged using anti-static gloves (PN SG-200-93-y-F150), before personnel can safely touch the windshield and canopy.

WARNING

Canopy has dual rocket motors mounted on canopy frame. With canopy open, rescue personnel may be seriously injured if rocket motors are ignited.

a. To safety canopy unlatch thruster and canopy rocket motors, insert safety pin, if available, into canopy jettison handle. Use safety pin for applicable model.

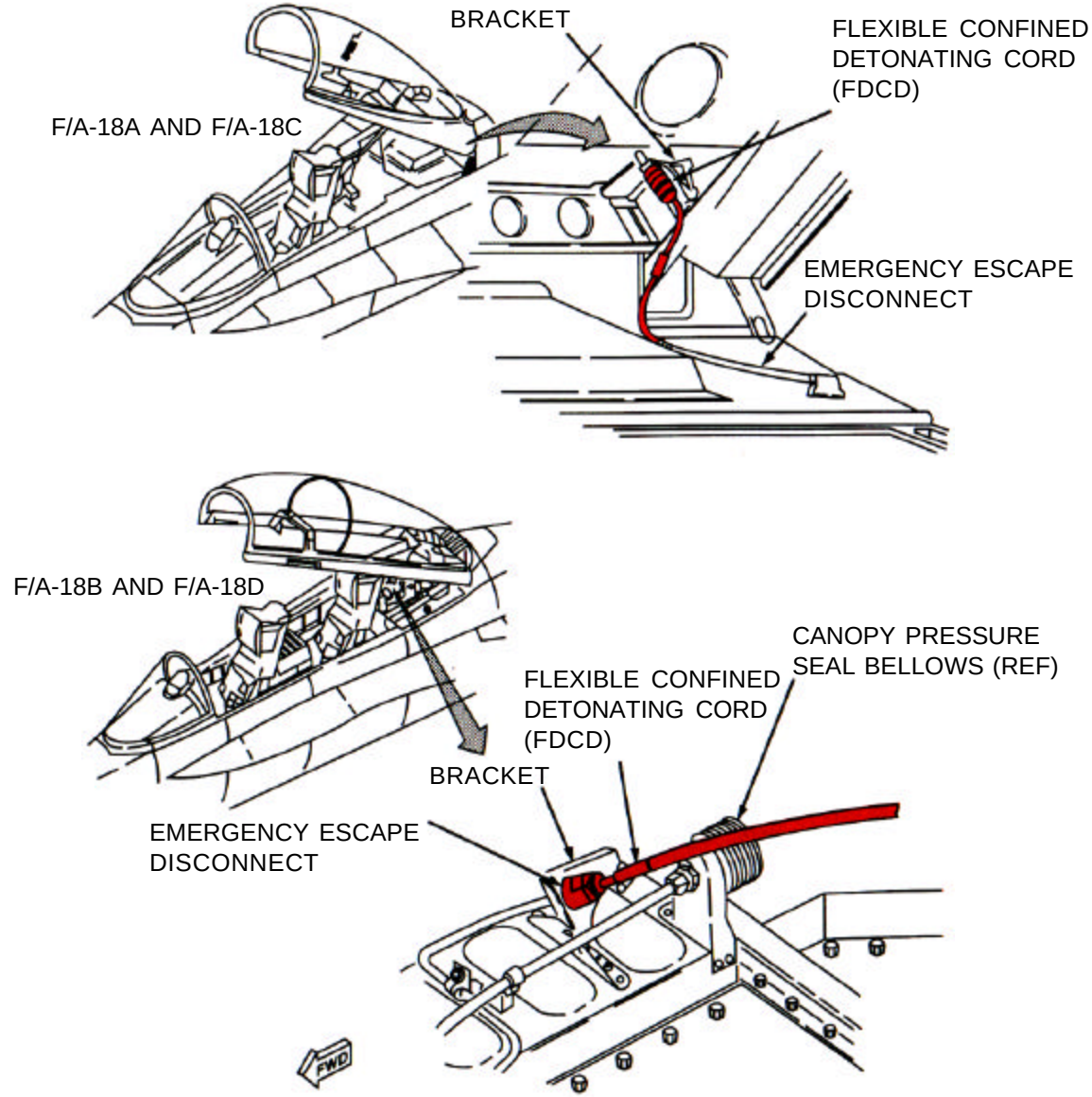
NOTE:
Insert safety pin with canopy jettison handle in forward position.



CANOPY SAFETY-Continued

1. CANOPY SAFETY FOR F/A-18A/B/C/D-Continued

b. Grasp quick disconnect hose, located at canopy behind ejection seat, and pull down to disconnect the emergency escape disconnect. This disarms the canopy thruster and rocket motors. Use quick disconnect for applicable model.



ENGINE AND APU SHUTDOWN

1. ENGINE SHUTDOWN-NORMAL AND EMERGENCY

NOTE:
The engines may be shut down by using the throttles or fuel shutoff valve controls.

a. Raise finger lifts and move throttles, located on the left cockpit console, fully aft to OFF position.

b. Lift guard and press the left and right fire warning lights, located on the upper forward instrument panel. A time delay of approximately 30 seconds or less (with engines at MIL through IDLE) may be expected before engine shutdown occurs.

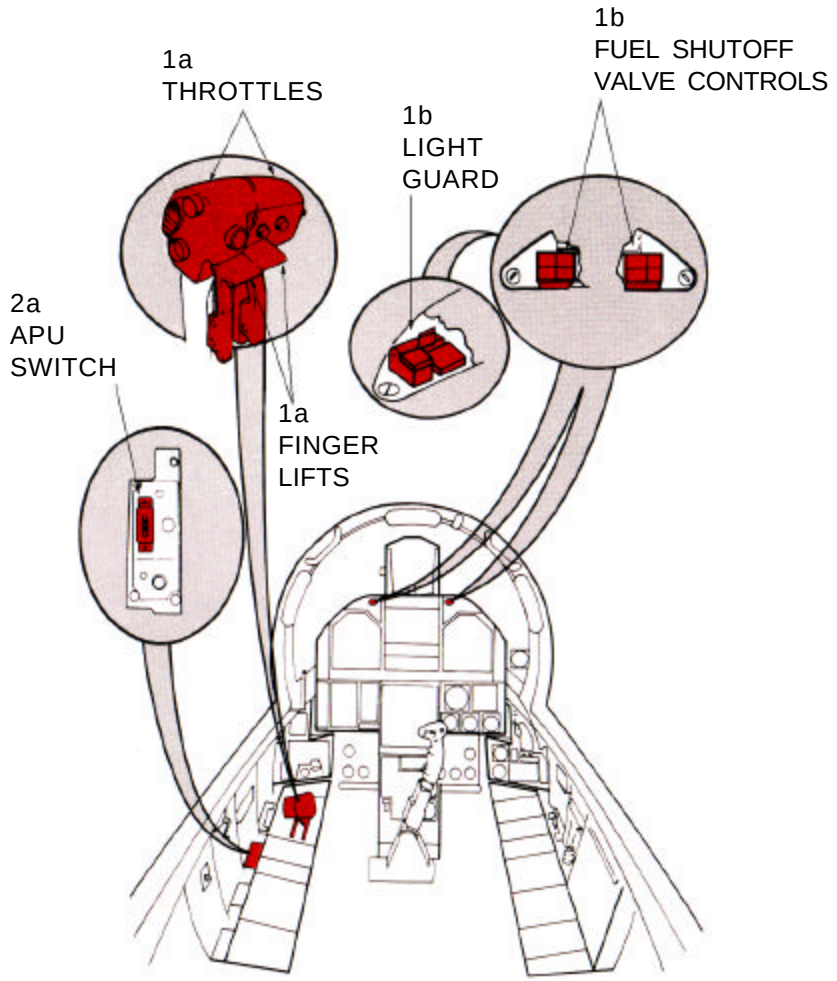
NOTE:
On aircraft 160775 thru 160782 (F/A-18A, Cum 1 thru 7; F/A-18B, Cum 1), fuel shutoff valve controls are located aft of throttles. Pull controls to FULL UP position.

2. APU SHUTDOWN-NORMAL AND EMERGENCY

a. Auxilliary Power Unit (APU) may be shut down by placing APU switch, located on the left cockpit console aft of the engine throttles, in OFFposition.

WARNING

Puddling of fuel under aircraft indicates presence of residual fuel in engine bay. With APU running, this can cause fire or explosion. Ensure APU shutdown prior to crewmember rescue.



ENGINE AND APU EXTERNAL SHUTDOWN

1. ENGINE AND APU EXTERNAL SHUTDOWN

a. Disconnect electrical plug. If plug can not be disconnected, cut electrical cable with insulated cutters.

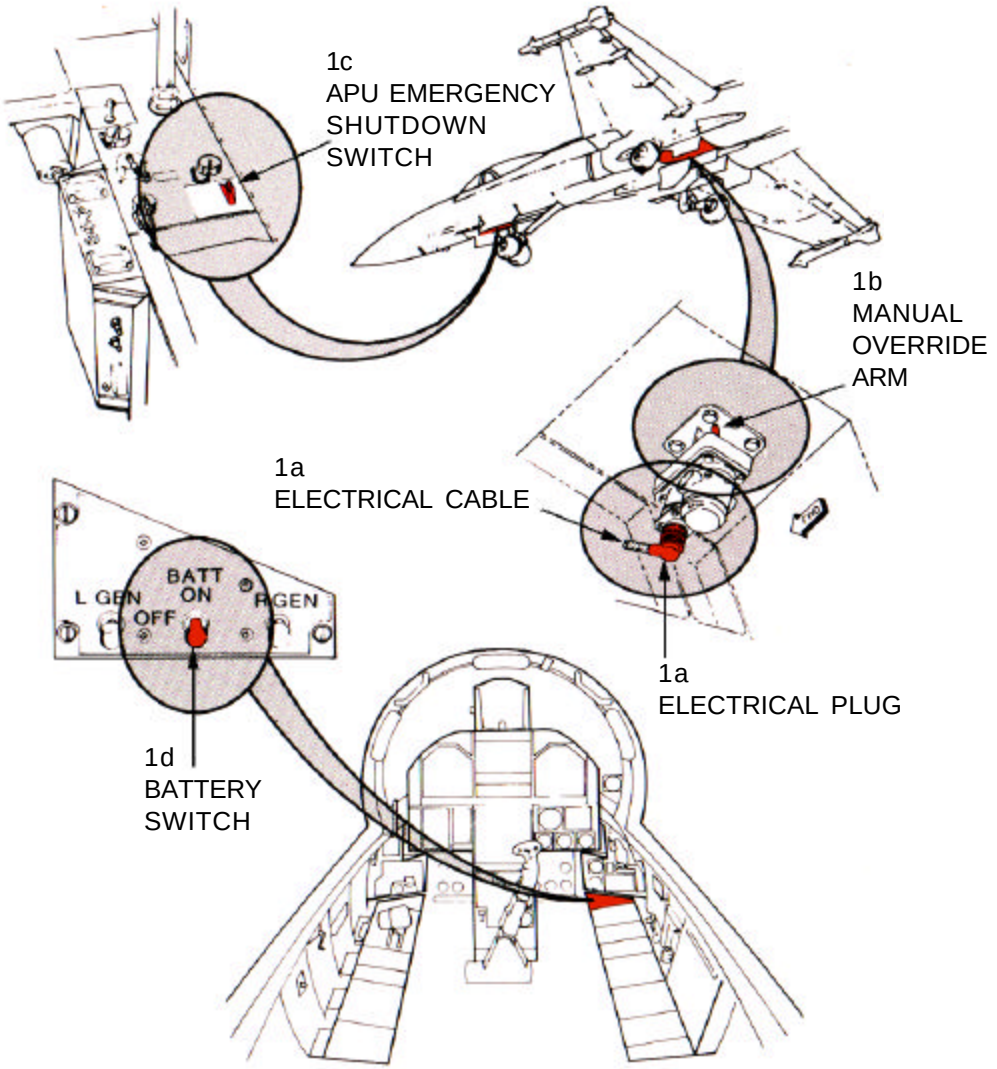
b. Turn manual override arm clockwise to CLOSED position.

NOTE:
On aircraft 160775 thru 160782 (F/A-18A, Cum 1 thru 7; F/A-18B, Cum 1), cut fuel shutoff valve linkage then turn shutoff valve arm forward.

c. Place APU emergency shutdown switch (LH side of nose wheelwell) down in shutdown position.

d. Place battery switch in OFF position to semi-isolate the two batteries.

e. To completely isolate the aircraft batteries, open external doors 10R and 10L (4 latches each), using a 1/4 inch drive socket wrench. Disconnect 4 battery bayonet couplings (2 per battery), turn couplings counterclockwise and pull.



MARTIN-BAKER SJU-5/A, 6/A AND SJU-17(V)1/A, 2/A EJECTION SEATS

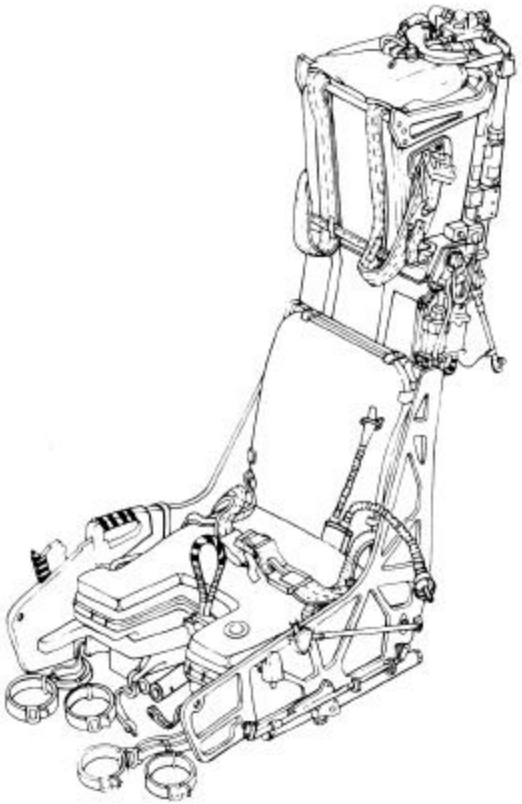
1. GENERAL INFORMATION

The F/A-18 uses two types of Martin-Baker ejection seats, the SJU-5/A, 6/A and SJU-17 (V) 1/A, 2/A. Both types are a rocket assisted ejection seat that provides support and necessary environmental equipment for crewmembers during flight, and a means of fast, safe escape during emergency flight conditions. The seat assembly incorporates features permitting seat ejection at ground level, at zero airspeed as well as during emergency flight conditions.

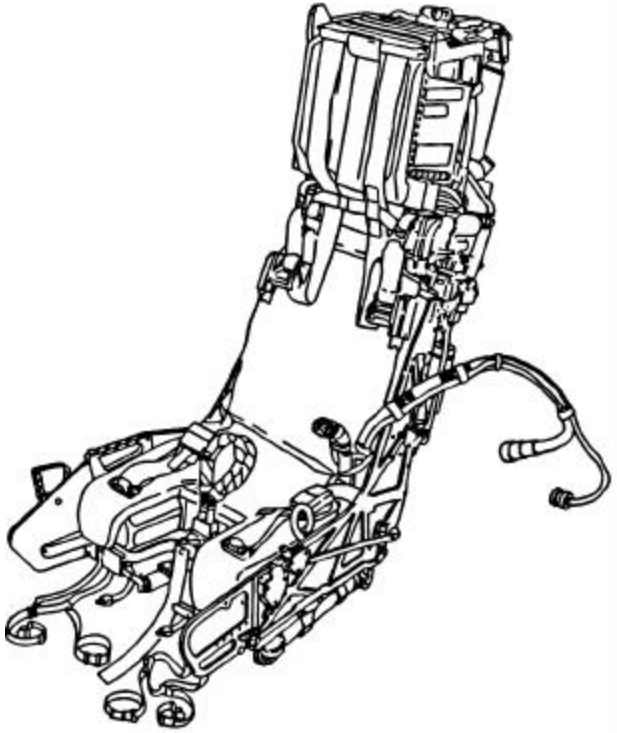
The basic structure of the seat consists of a main beam assembly, built to withstand high G-loads, support all of the components, and form the main framework for the seat.

The basic components of the seat assembly include a catapult, gas powered inertia reel, rocket motor, seat bucket assembly, drogue gun, parachute, guillotine, and survival equipment.

This ejection seat presents definite hazards which may cause fatal injuries to uninformed and careless personnel. Firefighting/rescue personnel must become thoroughly familiar with the locations and the safetying of the seat components in both normal and emergency conditions.



SJU-5/A, 6/A



SJU-17(V)1/A, 2/A

EJECTION SEAT SAFETYING

1. EJECTION SEAT SAFETYING-NORMAL AND EMERGENCY-SJU-5/A, 6/A MODEL

NOTE:

Immediately upon gaining access to the aircraft cockpit, if time permits and no hazardous conditions exist, proceed with seat safetying procedures.

WARNING

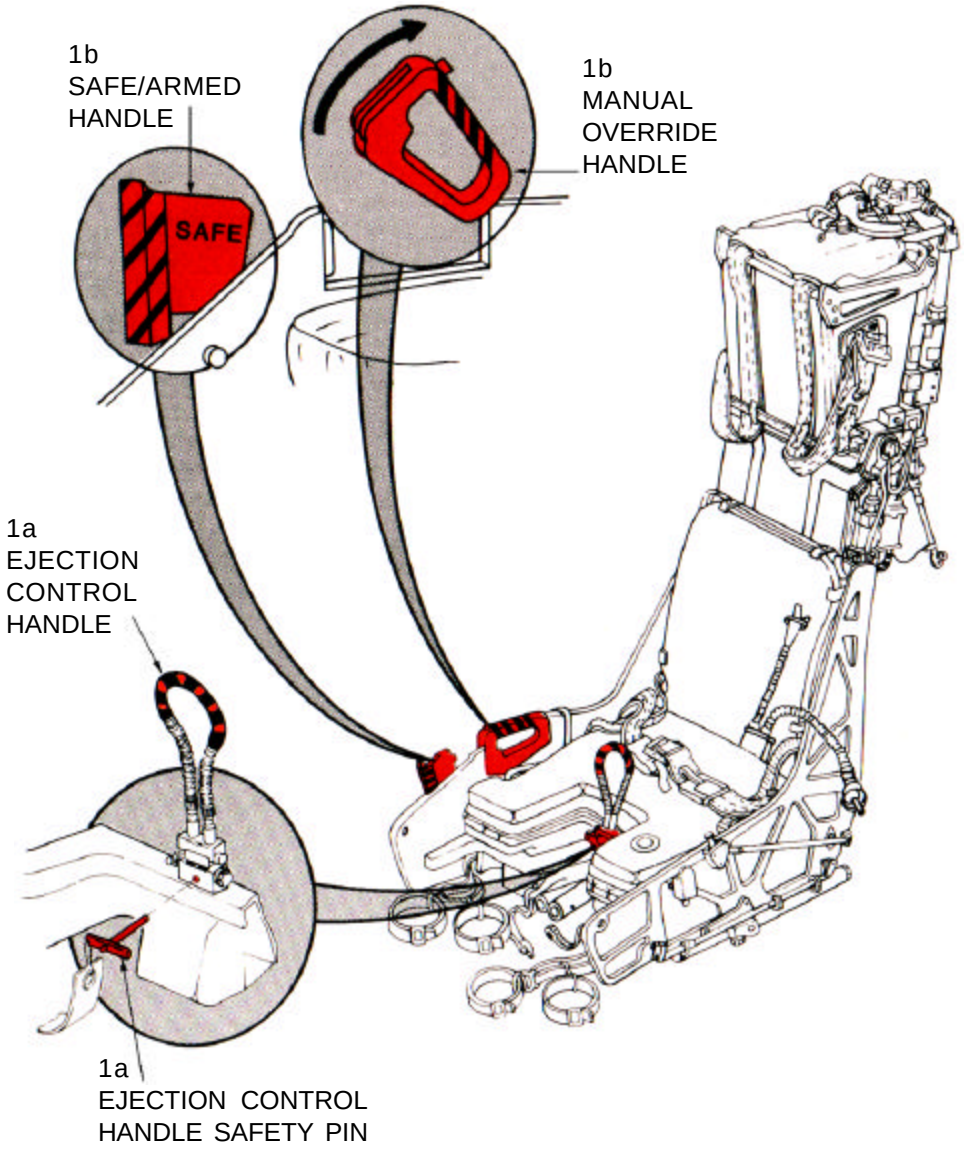
If ejection control handle is not fully seated, safety pin cannot be installed and safe/armed handle cannot be rotated to the fully locked position. An unsafe seat exists if the entire word “SAFE” is not visible on the safe/armed handle. If ejection seat is not in a safe condi tion, initiation may occur if ejection control handle is pulled. Proper procedures for reset ting handle must be followed.

a. Insert safety pin into ejection control handle if handle is in first detent (stowed) position. If ejection control handle is not in stowed posi tion, return handle to first detent (stowed position) by pressing handle into its housing and inserting safety pin.

b. Press button on top of manual override handle and rotate handle UP and AFT. The safe/ armed handle will simultaneously rotate up and the entire word “SAFE” should be visible.

WARNING

In multi-seat aircraft, all ejection seats must be safetied.



EJECTION SEAT SAFETYING-Continued

2. EJECTION SEAT SAFETYING-NORMAL AND EMERGENCY-SJU-(V)1/A, 2/A MODEL

NOTE:

Immediately upon gaining access to the aircraft cockpit, if time permits and no hazardous conditions exist, proceed with seat safetying procedures.

WARNING

If ejection control handle is not fully seated, safety pin cannot be installed and safe/armed handle cannot be rotated to the fully locked position. An unsafe seat exists if the entire word “SAFE” is not visible on the safe/armed handle. If ejection seat is not in a safe condi tion, initiation may occur if ejection control handle is pulled. Proper procedures for reset ting handle must be followed.

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b. Press button on top of manual override handle and rotate handle UP and AFT. The safe/ armed handle will simultaneously rotate up and the entire word “SAFE” should be visible.

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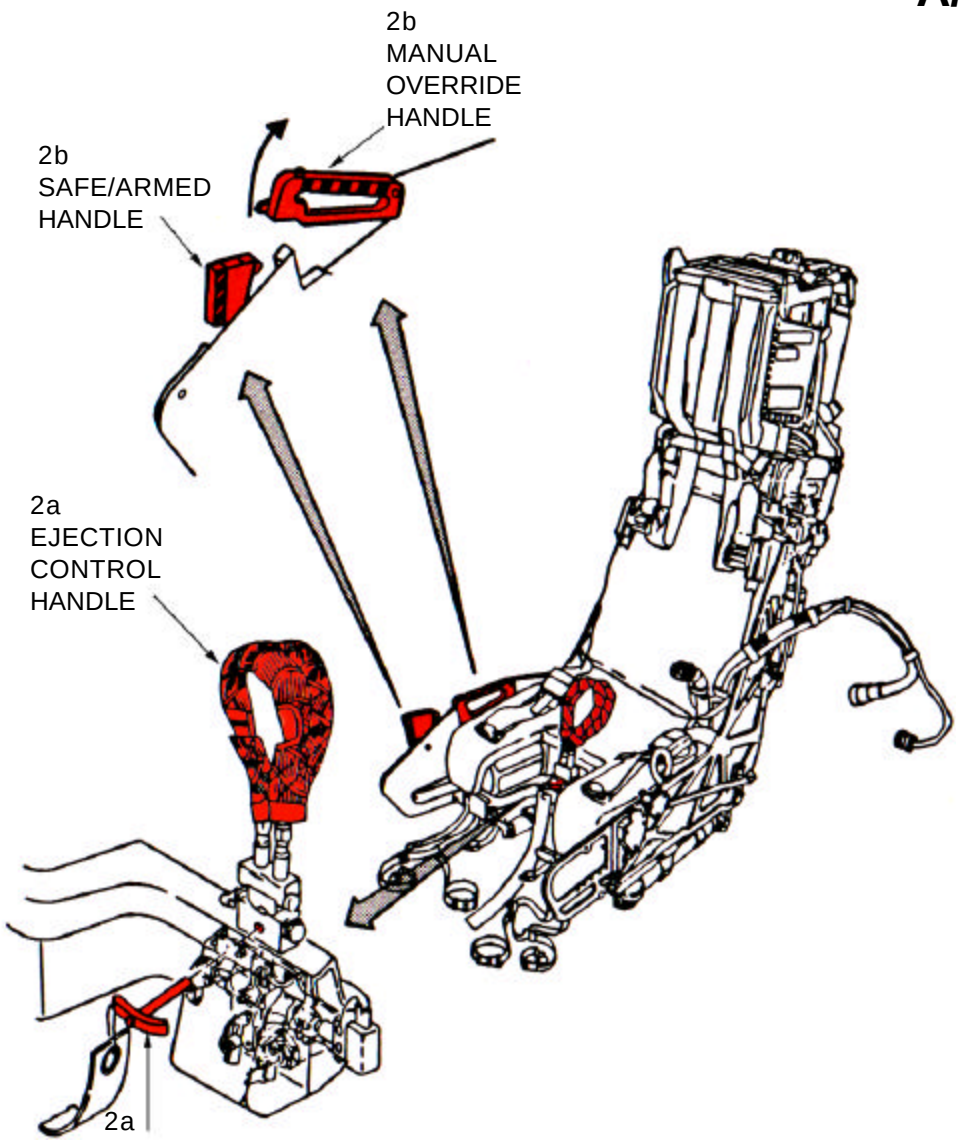

AIRCREW EXTRACTION

1. AIRCREW EXTRACTION

NOTE:
The crewmember is attached to the seat by the use of an integrated harness and leg restraints. Additionally, the oxygen/communication lead is attached to the survival kit. If the crewmember is wearing an anti-G suit, a hose will be attached to an outlet on the LH console.

a. To remove oxygen mask: Pull down release tabs on either side of crewmember helmet mask.

b. To disconnect the oxygen/communication lead at the survival kit on the left aft side of seat: Grasp knurled fitting on hose and pull up to disconnect.

c. To disconnect the anti-G suit: Pull anti-G suit hose from left seat connection.

d. To disconnect leg restraints: Release leg garters by applying pressure to tabs on both sides of each quick disconnect.

e. To disconnect restraints: Release two lap belt, then two shoulder harness koch fittings.

2. EMERGENCY RELEASE

a. Press thumb button on forward part of manual override handle, located on right side of seat, and rotate handle aft. This positions the safe/armed handle UP in safe position and releases lower leg restraint lines.However, the parachute and survival kit will remain attached to crewmember.